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**Question Paper Code : 71407**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

First Semester

Civil Engineering

CY 2111/CY 14/080010001 — ENGINEERING CHEMISTRY — I

(Common to all Branches)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why do we express hardness of water in terms of  $\text{CaCO}_3$  equivalents?
2. Write the principle of break point chlorination.
3. What is copolymerisation? Give an example.
4. How is Teflon prepared? Mention its uses.
5. What is adsorption?
6. What is heterogeneous catalysis?
7. Distinguish between nuclear fission and nuclear fusion.
8. How Ni-Cd battery is constructed?
9. Define refractoriness.
10. Differentiate SWNT and MWNT.

PART B — (5 × 16 = 80 marks)

11. (a) (i) How will you determine hardness of water by EDTA method? Explain. (8)
- (ii) Describe the process of demineralization of water. (8)

Or

- (b) (i) What do you understand by internal conditioning? Explain phosphate and calgon conditioning. (8)
- (ii) With a neat diagram, explain reverse osmosis method of desalination. (8)
12. (a) (i) Write the mechanism of free radical polymerization. What are the monomers which can be polymerized by free radical polymerization? (10)
- (ii) Write the differences between thermoplastics and thermosetting plastics. (6)

Or

- (b) (i) Write the preparation and uses of the following polymers.
- (1) Polycarbonate
- (2) Teflon. (8)
- (ii) How are polymer matrix composites and fibre reinforced plastics made? (8)
13. (a) (i) Derive Langmuir adsorption isotherm. (8)
- (ii) Discuss the various factors which affect the adsorption of a gas on solid adsorbent. (8)

Or

- (b) (i) Write briefly about the role of ion exchangers in pollution control. (8)
- (ii) Write a note on the role of adsorbents in catalysis. (8)
14. (a) (i) What are nuclear chain reactions? Explain how the amount of nuclear energy can be improved. (8)
- (ii) Explain the construction and working of a lead acid battery. (8)

Or

- (b) (i) What are fuel cells? Explain the construction and working of a fuel cell. (8)
- (ii) State the principle and application of solar batteries. (8)

15. (a) Explain the following :

(i) Natural and synthetic abrasives (8)

(ii) Refractories and their properties. (8)

Or

(b) Write a note on the following :

(i) Mechanism of lubrication (8)

(ii) Applications of nanomaterials. (8)